

**A Summary of SDI Programs and Plans for  
Theater and National Ballistic Missile Defenses**

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**INTRODUCTION**

The Missile Defense Act of 1991 (contained in the National Defense Authorization Act for Fiscal Years 1992 and 1993) established two fundamental goals with respect to missile defenses: (1) Deploy an ABM system capable of providing a highly effective defense of the U.S. against limited attacks of ballistic missiles; and (2) provide highly effective theater missile defenses (TMD) for U.S. expeditionary forces, friends, and allies. The Congress directed the Department of Defense to provide a deployment plan indicating how it would achieve these objectives.

In response, the Department's plan to meet these goals for national and theater ballistic missile defenses was forwarded to Congress on July 2, 1992, with an accompanying letter from the Secretary indicating his direction to the Department that this plan be implemented as "a top national priority, consistent with prudent management of cost, schedule, performance and technical risk factors."

The FY 1993 National Defense Authorization Act reaffirmed Congressional support for the Missile Defense Act of 1991, while the FY 1993 National Defense Authorization Conference Report indicated Congressional support for the Department's acquisition strategy.<sup>1</sup> The SDIO is pursuing this approved event-driven plan to meet Congressional requirements for highly effective theater and national ballistic missile defenses, modified, in the latter case for the Limited Defense System (LDS), to reflect the impact of the substantially reduced FY 1993 appropriations.

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<sup>1</sup> The Conference Report stated "that the baseline programs for TMD and the limited defense system (LDS) as set forth [in the Department's July 2, 1992 plan] constitute a low-to-moderate technical risk and low-to-moderate concurrency program as directed..."

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Recognizing the urgency of developing and fielding theater missile defenses, Congress endorsed our proposal to field a contingency (UOES<sup>2</sup>) Theater High Altitude Area Defense (THAAD) system in 1996, while components are still in the demonstration and validation phase. Congress was not persuaded, however, to endorse fielding an early contingency capability for U.S. homeland defenses -- although the Defense Authorization conferees indicated no objection to planning to provide such an option in the future. In any case, Congress removed the 1996 target date (advocated in the Missile Defense Act of 1991), and endorsed, instead, the core acquisition program leading to an initial site deployment in 2002.<sup>3</sup>

In summary, our strategy is to improve rapidly upon existing theater missile defense capabilities inherent in the PATRIOT and AEGIS systems; to develop and field advanced theater systems, such as THAAD, by the mid-1990s; to provide a U.S. homeland defense option as soon as sufficient integrated testing is completed; and to develop follow-on technologies that could, within 15 years, significantly enhance either TMD or U.S. homeland defense capabilities.

## THEATER MISSILE DEFENSE INITIATIVE

The FY 1993 National Defense Authorization and Appropriation Acts essentially fully funded the President's budget request for TMD; endorsed the use of prototypical hardware for a THAAD contingency capability in 1996; endorsed the Department's initiatives to establish a Navy TMD program and substantially increased the President's requested funding level; generally reaffirmed the directions of the Missile Defense Act of 1991 regarding TMD; and established a separate Theater Missile Defense Initiative (TMDI) program.

The new TMDI program is under the management and direction of the SDIO Director, as explicitly allowed by the FY 1993 National Defense Authorization

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<sup>2</sup> The User Operational Evaluation System (UOES) can best be thought of as exploiting operational assessment prototypes, providing, in case of an urgent operational need, a "system" capability during the demonstration and validation stage of development. Such a contingency capability was demonstrated by the operational utility of JSTARS in a combat situation during the Gulf War. While the UOES undergoes field testing and early operational assessment, the underlying or core acquisition program continues through the engineering and manufacturing development phase.

<sup>3</sup> Under the current funding plans for the core acquisition program, a homeland UOES defense could be available, at low-to-moderate risk and concurrency, in the year 2000, should a decision be made in FY 1997 to pursue that option. There is no cost impact for such planning prior to a decision in FY 1997 to field the UOES. Execution of such an option would require \$1.5 to \$2.0 billion over the next three to five years following FY 1997 -- the bulk of which would be required to support the core acquisition program anyway, except somewhat later.

Conference Report.<sup>4</sup> The focus of this program is to improve incrementally our existing active defense capability, while developing advanced systems to provide highly effective protection -- for U.S. forces deployed abroad as well as our friends and allies -- against theater ballistic missiles (TBM) as soon as feasible, consistent with sound acquisition procedures. The program is being planned and conducted in coordination with all the Military Departments and in keeping with Congressional guidance to preserve bipartisan support for TMDI.

The Department's July 2, 1991 Plan for Deployment of Theater and National Ballistic Missile Defenses, outlined the near, mid, and far term TMDI acquisition strategy, as indicated in Figure 1. In its FY 1993 Defense Authorization Act, Congress reaffirmed its strong support for theater ballistic missile defenses and endorsed the Department's acquisition strategy.

The near term (FY 93-95) TMDI plan calls for upgrading HAWK, PATRIOT, and existing sensor systems such as the Defense Support Program (DSP). To move beyond the inherent limitations of a point or limited area defense system, the plan calls for providing, in the mid-to-far term, wide area defensive coverage, using the Theater High Altitude Area Defense (THAAD) interceptor system and upgrading the Navy's existing AEGIS/Vertical Launch System capability.

To respond to the MDA mandate for fielding an advanced TMD capability by the mid-1990s, a prototype THAAD "battery" User Operational Evaluation System (UOES) will be provided during the demonstration and validation phase for early operational assessment, with the potential to be fielded during a crisis situation. This UOES configuration will consist of three THAAD launchers, 40 missiles, two TMD-GBR radars, and associated Battle Management, Command, Control and Communication (BMC3). The decision to produce units for operational evaluation is planned for FY 1994 to provide a contingency capability as early as in FY 1996 -- an approach endorsed by Congress.

Also during this midterm (FY 96-99) period, we plan to introduce PAC-3 upgrades to the Patriot system, including possible enhancements from the ERINT program. We also plan to provide a sea-based PAC-3-like underlay system capability using a ship launched interceptor capable of defending debarkation ports, coastal

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<sup>4</sup> The Conferees indicated that while they intended that the TMDI be separate from SDI, they also directed that "TMDI and SDI programs, projects, and activities that share common technologies or requirements be closely coordinated, including the use of combined or joint funding and management where appropriate. This direction is designed to ensure the avoidance of redundancy to obtain both technological and financial efficiencies, and to maximize the incorporation of common technologies in specific theater and strategic missile defense systems." They left it to the Secretary of Defense to determine the most appropriate arrangement for the management and program direction of the TMDI, "including placing TMDI under the management and direction of the Director of SDIO."

| Figure 1. Theater Active Defense Architecture        |              |   |  |  |
|--|--------------|---|--|--|
|  |              | Possible Elements   |  |  |
| Framework  |              | Near Term<br>FY 93 - 95   | Midterm<br>FY 96 - 99  | Far Term<br>FY 2000+   |
| Lower Tier   | Ground Based | <ul style="list-style-type: none"> <li>• PATRIOT PAC-2 Upgrades</li> <li>• HAWK (USMC)</li> </ul>             | <ul style="list-style-type: none"> <li>• PATRIOT PAC-3</li> </ul>  | <ul style="list-style-type: none"> <li>• CORPS SAM</li> </ul>  |
|  | Sea Based    | _____   | <ul style="list-style-type: none"> <li>• AEGIS SM-2 Block IV A</li> <li>• SPY-1 Mod</li> </ul>   | _____  |
| Upper Tier   | Ground Based | _____   | <ul style="list-style-type: none"> <li>• THAAD (UOES)</li> <li>• TMD-GBR (UOES)</li> </ul>   | <ul style="list-style-type: none"> <li>• THAAD (Objective)</li> <li>• TMD-GBR (Objective)</li> </ul>   |
|  | Sea Based    | _____   | _____  | <ul style="list-style-type: none"> <li>• Sea Based TMD Interceptor *</li> <li>• SPY Upgrade</li> </ul>   |
| Boost Phase Intercept                                |              | _____   | _____  | TBD  |
| Warning And Surveillance                             |              | <ul style="list-style-type: none"> <li>• Tactical DSP Processing</li> <li>• TPS - 59</li> </ul>               | _____  | <ul style="list-style-type: none"> <li>• Brilliant Eyes</li> </ul>   |
| Battle Management / Command, Control, Communications |              | <ul style="list-style-type: none"> <li>• DSP Data Dissemination</li> <li>• Standardized Interfaces</li> </ul> | <ul style="list-style-type: none"> <li>• AEGIS BM / C3 Mod</li> <li>• Surveillance Data Netting</li> <li>• Communication Upgrades</li> </ul> | <ul style="list-style-type: none"> <li>• Theater Command Center Modifications</li> <li>• AEGIS BM / C3 Upgrades</li> <li>• Cooperative Engagement</li> </ul> |
| * Possible UOES FY 98                                |              |   |  |  |

airfields, amphibious objective areas, and expeditionary forces as they are inserted ashore. This will involve software modifications to the AEGIS SPY-1 radar, weapon control system improvements, and improvements to the warhead, fuse and seeker of the existing SM-2 Block IV missile.

Then, in order to fully capitalize on the nation's investment in the AEGIS fleet (up to 50 ships authorized to date), we plan to test a theater-wide capability using the existing STANDARD missile and exploiting the Lightweight Exoatmospheric

Projectile (LEAP) hit-to-kill technology.<sup>5</sup> Together with the extensive BMC3 capability inherent in the AEGIS ships, this approach promises to provide the targeting, sensors, and long-range missiles necessary to achieve a true theater-wide missile defense capability this decade at relatively low cost (about 10 percent of the nation's prior investment of \$40-45 billion in the AEGIS fleet).

Beginning in about FY 2000, Brilliant Eyes will be available to help with warning and surveillance data and to enhance significantly the coverage of theater missile defenses, including the fully deployed THAAD and wide-area maritime TMD options. Also during this far term period, TMD capabilities could be added to the architecture in the form of the short-range CORPS SAM, Boost Phase Interceptors and Brilliant Pebbles.<sup>6</sup>

A robust system would include the ability to intercept TBMs as early in their flight trajectory as possible -- and more than once, in a multi-tier defensive approach, before such TBMs reach their target area. Further, multiple basing modes, including ground-based, air-based, sea-based, and space-based defensive capabilities, seem desirable to meet the full range of projected future engagements.<sup>7</sup>

Funding for the TMDI, as depicted in Figure 2, grows to about \$3 billion (FY 1991 dollars) over the next two years and remains at that level for the next six to seven years. Also shown are the projected "then-year" dollar funding requirements for the next seven years. The Army share is approximately 50 percent of the total, with 25 percent going to the Navy, 13 percent for the Air Force, and 12 percent for execution by SDIO.

The overall funding requested for TMD programs has increased over last year for two reasons. First, certain important activities (particularly BMC3, the ground-

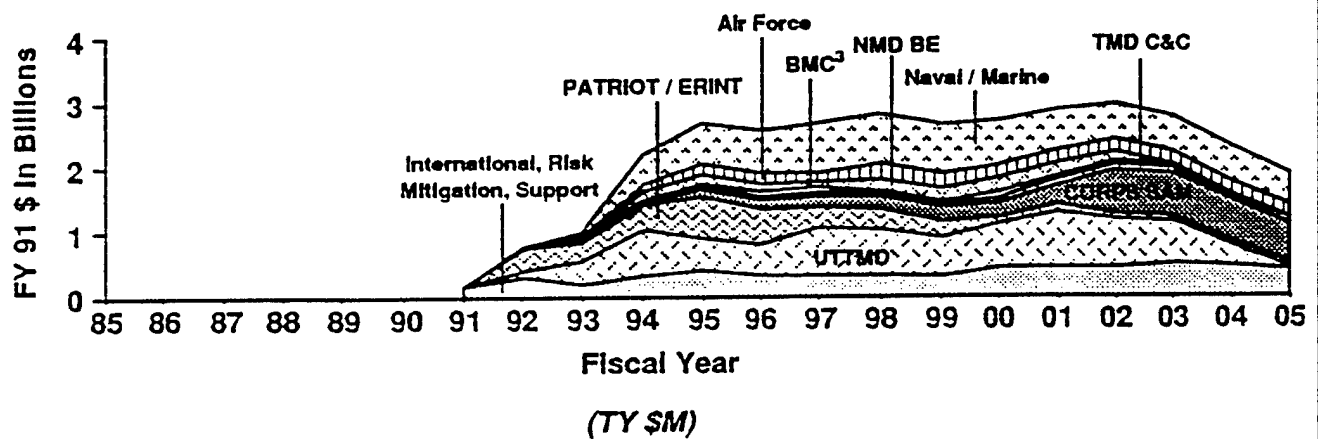
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<sup>5</sup> In September 1992, the USS Richmond K. Turner (CG-20) validated the concept of the STANDARD missile launch vehicle by launching into space a TERRIER round with a payload built to the dimensions and weight of a LEAP.

<sup>6</sup> SDIO is working closely with the Air Force to institute a viable TMD program to provide a boost phase intercept capability as early as possible to respond to reactive countermeasures, such as clustered chemical submunitions. Such an initiative is warranted based upon Red-Blue team studies and independently by the Air Force Scientific Advisory Board and the Defense Science Board. As per Congressional direction, SDIO has transferred over \$400 million from its out-year POM to the Air Force to establish an Advanced Technology Program for this purpose -- to which the Air Force has contributed an additional \$ 288 million.

<sup>7</sup> When politically acceptable, space-based interceptors can play a very important role in a TMD context in providing global defensive capabilities at any time, particularly before and during the mobilization period at the outbreak of future regional crises when terrestrially based defenses have not been pre-deployed. These possibilities were discussed in our March 1992 Report to Congress: Conceptual and Burden Sharing Issues Related to Space-Based Ballistic Missile Defense Interceptors.

**Figure 2. Theater Missile Defense Program**



|   | <u>FY 93</u> | <u>FY 94</u> | <u>FY 95</u> | <u>FY 96</u> | <u>FY 97</u> | <u>FY 98</u> | <u>FY 99</u> |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| CORPS SAM                               | 23           | 53           | 113          | 193          | 225          | 240          | 267          |
| PATRIOT / ERINT                         | 306          | 433          | 748          | 624          | 387          | 400          | 348          |
| UTMD (THAAD, TMD-GBR)*                  | 403          | 774          | 574          | 585          | 889          | 906          | 769          |
| NMD (BE)*                               | 0            | 136          | 154          | 118          | 117          | 215          | 271          |
| BMC <sup>3</sup> (CCE, Test, AI)*       | 0            | 14           | 52           | 84           | 86           | 64           | 60           |
| TMD Command & Control                   | 10           | 28           | 48           | 69           | 63           | 67           | 53           |
| Naval / Marine                          | 97**         | 486          | 708          | 756          | 911          | 977          | 1015         |
| Air Force                               | 50           | 143          | 208          | 227          | 191          | 306          | 295          |
| International, Risk Mitigation, Support | 214          | 375          | 475          | 390          | 415          | 416          | 411          |
| <b>Total</b>                            | <b>1103</b>  | <b>2441</b>  | <b>3078</b>  | <b>3046</b>  | <b>3283</b>  | <b>3591</b>  | <b>3489</b>  |

\* TMDI, USDI Joint Program Funding

\*\* Congress Directed A Minimum Of \$90 Million. Also, FY 93 Program Is Supplemented By \$150 Million In SDI For LEAP Demonstration Efforts, Which In The Out Years Are Included In The Naval / Marine Portion Of The TMDI Budget

based radar and BE) are now jointly funded under TMDI and the LDS program element in keeping with Congressional guidance that there be close coordination between TMDI and SDI programs that involve common requirements, technology, and/or program elements. Second, substantial funds were added to the Navy and Air Force TMD efforts to support programs strongly advocated by the respective Service -- and, at least in the case of the Navy TMD effort, by the Congress.

In summary, the central thrust of TMDI in the near and mid-term is the upgrading of PATRIOT, the addition of wide-area, high endoatmospheric terminal, and exoatmospheric, midcourse intercept capability with the THAAD/TMD-GBR; the

upgrading of the AEGIS/SM-2/Block IV system; and the provision of a long-range, theater-wide sea-based exoatmospheric intercept TMD capability. (The options for high pay-off, countermeasure responsive Boost Phase Intercept will be determined in 1993). The TMD architecture can be expected to evolve as studies continue, designs proceed, technology advances, and live tests and assessments are conducted. As the geopolitical situation evolves, SBI and other follow-on technologies may be exploited to enhance substantially our TMD capabilities. Several key down-select decisions are scheduled for the next few years as the detailed design and architectural studies proceed.

## UNITED STATES DEFENSE INITIATIVE

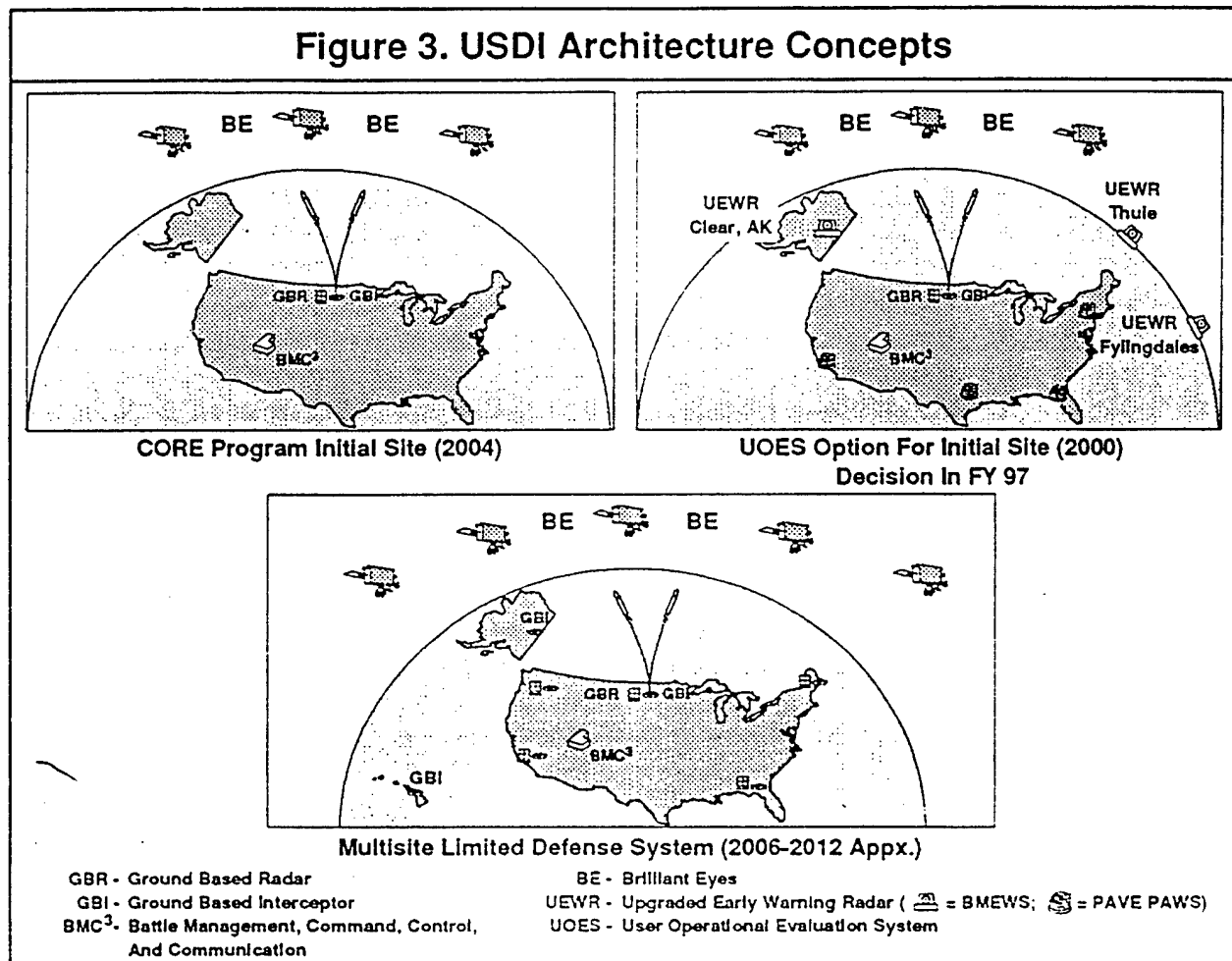
Dealing with SDI programs directed at defending the United States has been more complex than for theater defenses. The main issue has been how, in view of the severe FY 1993 Congressional budget cuts and relaxed sense of urgency, to realign our event-driven acquisition strategy, which Secretary Cheney submitted to Congress on July 2, 1992 and which he directed be executed within the Department as a top national priority. It was deemed important to preserve this basic event-driven acquisition strategy that was acknowledged to be a low-to-moderate risk/concurrency plan by the FY 1993 National Defense Authorization Act Conferees. As discussed in our July 2 Report to Congress, an option also could be provided to obtain needed nearer term contingency capabilities while creating a base to support an evolutionary improvement of capabilities in the mid and far term.<sup>8</sup>

The FY 1993 Defense Authorization Conferees indicated their interest in fielding the initial site by FY 2002. The pace at which we can develop ballistic missile defenses for the U.S. homeland is, of course, contingent upon Congressional funding and a decision by the FY 1997 time period whether to pursue the UOES approach. Given the Congressional cuts in the President's FY 1993 request, deployment could be as early as FY 2000 under the UOES option or as late as 2004 under the core, event-driven acquisition program if no UOES option is exercised. These dates represent an 18 month slip in the core program as presented to Congress

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<sup>8</sup> This option would employ UOES elements in a way analogous to that which was approved to achieve an early contingency THAAD capability in 1996. The Congress explicitly did not authorize funds for acquiring and fielding such a UOES capability for a U.S. defense, but did explicitly indicate that planning to provide such a future option was appropriate.

in July 1992 -- which, otherwise, follows the same event-driven acquisition strategy.<sup>9</sup> Figure 3 depicts these architecture concepts.



According to our current baseline plan, the initial site system will consist of a ground-based radar (GBR), up to 100 ground-based interceptors (GBI), a collocated Regional Operation Center (ROC) containing the Battle Management, Command, Control and Communications apparatus, and a treaty-compliant Brilliant Eyes (BE)

<sup>9</sup> The authorized and appropriated FY 1993 funding levels reduced the President's request for LDS-related activities by at least \$700 million, leading to a schedule slip from the plan submitted to the Congress on July 2. Furthermore, Congress removed the 1996 target date for fielding the initial site, supporting, instead, the core acquisition strategy, directed toward an initial site capability in 2002, which corresponded to the CIA Director's testimony that no new nations are expected to threaten the U.S. with ballistic missile attack for 10 years. SDIO, therefore, could not justify to OSD acquisition authorities a sole-source extension of the current System Engineering and Integration (SE&I) contract. The recompetition of this major contract will lead to an 18 month schedule delay in the event-driven, low-to-moderate concurrency/ risk acquisition strategy endorsed by Congress.

system. It is emphasized that, with our proposed budget, an initial capability of an ABM Treaty-compliant version of BE,<sup>10</sup> the space-based sensor to provide cuing and initial targeting data, can be available in FY 2000. This sensor capability will permit the GBI under our core program to protect the entire continental United States from the initial site against attacks from northerly directions. Thus, no interim sensor system is required to support the initial site -- even if early UOES elements are fielded, should the Congress approve that option in the future.

As noted above, planning for such a UOES option is consistent with the FY 1993 National Defense Authorization Act. This UOES concept would involve prototypical interceptors which might not have the full performance capability of the later production units, but would provide significant contingency capability to protect the entire continental United States against a limited attack.

The necessary restructuring of our July 2 plan to respond to Congressional FY 1993 funding cuts and guidance to pursue a low-to-moderate risk/concurrency program leads to FY 2000 as the earliest that such a UOES site could be activated.<sup>11</sup> The system would include the GBR, up to 100 GBIs and, with current funding, an initial Brilliant Eyes (BE) capability to cue the GBIs. As a fallback to BE, should there be delays in the acquisition program, upgrades to our existing early warning radar network that could provide early cuing for the defensive interceptors are planned; no funding before FY 1997 is required to preserve this option.

For such a contingency defense in 2000, no funding commitments beyond those to support the core program need to be made until the beginning of FY 1997, when, with programmed funding, the key technical objectives for all system elements will have been verified under the dem/val program. This contingency capability would grow and improve in an evolutionary fashion, under continued testing and evaluation and subsequent technology upgrades, as an engineering and manufacturing development phase firms up the design for subsequent sites.

We estimate that the UOES will require a total of about \$1.5-2 billion (\$FY91), beginning in FY 1997 and spread over three to five years. Most of these dollars would represent an early (as compared to the core acquisition plan) investment for

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<sup>10</sup> According to the FY 1993 National Defense Authorization Act, this treaty-compliant BE system could provide cuing to ground-based interceptors and initial targeting vectors -- as emphasized in the attached letter from Senators Thurmond, Warner, and Wallop. The Administration has yet to make a determination on the issue of BE compliance with the ABM Treaty, as indicated in the SDI Director's response. It is also important to note that BE is valuable not only for the initial U.S. missile defense site, but once deployed, can also furnish a global surveillance capability for multiple purposes and, as noted earlier, can contribute to the Theater Missile Defense mission as well.

<sup>11</sup> Actually, at somewhat higher concurrency and risk, the initial site could be accelerated an additional year to FY 1999.

site preparation, construction, production and installation. The expected cost of prototypical hardware is about \$200-300 million, mostly for UOES interceptors. Upgrades to the early warning radars, if required because of delays in developing BE, would cost about \$400 million.

The total acquisition program for the ground-based elements of the initial site, including necessary risk mitigation and technology insertion activities, is expected to cost \$22-24 billion in constant FY 1991 dollars -- whether or not the UOES option is executed.<sup>12</sup> It is anticipated that the total acquisition cost of BE will be \$4-5 billion. Thus, the total cost for a single site system to defend the continental United States against limited attacks from the north is expected to be \$26-29 billion.

Enhancement and expansion of the initial site defense system to include additional sites would be necessary to achieve the goals stated by the MDA for the Limited Defense System (LDS). The LDS architecture for the defense of the United States ultimately would include multiple ground-based interceptor sites supported by both ground-based radars and space-based sensors. The number of ground based sites is driven by the nature of the threat; SDIO is presently budgeting for four sites in the continental U.S., with GBI sites in Alaska and Hawaii.

If the core acquisition program is followed, the second site would follow two years after the initial site is activated in FY 2004; additional sites would follow every two years. Acquisition cost for five additional sites is estimated to be about \$15-18 billion, with the later sites costing less -- perhaps as low as \$2 billion for the fifth and sixth sites which are not intended to include ground-based radars.<sup>13</sup> If the contingency plan is followed to field a UOES in FY 2000, or at some other earlier date, then this plan would be modified as appropriate to either deploy prototypical hardware at additional UOES sites earlier -- or to maintain the core program plan depending on how the threat is perceived in the future.

Funding for the multi-site Limited Defense System, which includes funding for the initial treaty-compliant site as well as allocated management costs, is depicted in Figure 4. Also included are the projected "then-year" dollar funding requirements over the next seven years. About \$3 billion (in FY 1991 dollars) for each of the next

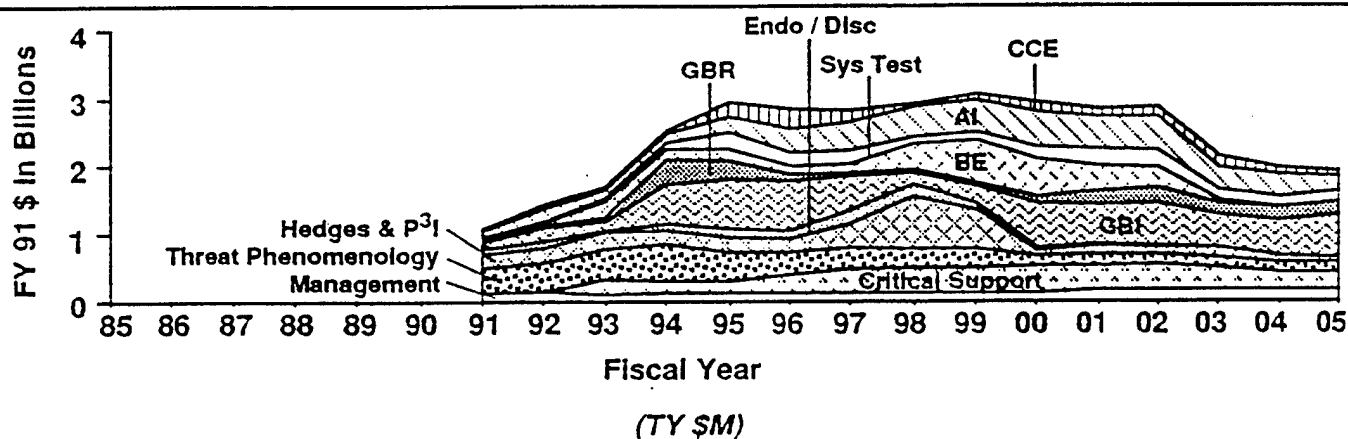
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<sup>12</sup> In Congressional testimony last year, I indicated that the ground-based elements of the initial site would cost \$16-18 billion. Two-thirds of the \$6 billion increase noted above results from increases in the cost estimates of the ground based interceptor (based on independent cost estimates provided by the DoD Cost Analysis Improvement Group (CAIG)) and one-third is associated with the 18-month slip due to Congressional budget cuts.

<sup>13</sup> This estimate has increased over the past year because of increased cost estimates for the ground-based interceptor and program stretch-out due to the Congressional budget cuts.

six years will be required to hold the above discussed schedule for this program.<sup>14</sup>

**Figure 4. Limited Defense System (With Allocated Management)**



|                              | <u>FY 93</u> | <u>FY 94</u> | <u>FY 95</u> | <u>FY 96</u> | <u>FY 97</u> | <u>FY 98</u> | <u>FY 99</u> |
|------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| GPALS / BMC <sup>3</sup>     | 223          | 312          | 811          | 1013         | 980          | 753          | 882          |
| CCE*                         | 53           | 55           | 267          | 350          | 208          | 61           | 118          |
| AI*                          | 139          | 146          | 252          | 412          | 521          | 574          | 629          |
| Sys Test*                    | 31           | 111          | 292          | 251          | 251          | 119          | 136          |
| NMD                          | 471          | 1202         | 1345         | 1104         | 819          | 764          | 1217         |
| BE*                          | 241          | 170          | 189          | 147          | 145          | 492          | 813          |
| GBR*                         | 88           | 399          | 308          | 107          | 68           | 49           | 65           |
| GBI*                         | 142          | 633          | 847          | 850          | 606          | 223          | 340          |
| E <sup>2</sup> / Endo / Disc | 19           | 115          | 140          | 160          | 222          | 219          | 110          |
| Hedges & P <sup>3</sup> I    | 281          | 204          | 253          | 212          | 445          | 960          | 765          |
| Threat Phenom                | 444          | 594          | 458          | 378          | 361          | 333          | 312          |
| Critical Support**           | 240          | 187          | 186          | 309          | 423          | 475          | 507          |
| Management                   | 117          | 144          | 148          | 149          | 150          | 151          | 152          |
| Total                        | 1795         | 2758         | 3340         | 3325         | 3399         | 3655         | 3946         |

\* TMDI, USDI Joint Program Funding

\*\* Previously Funded In The Research And Support Program Element

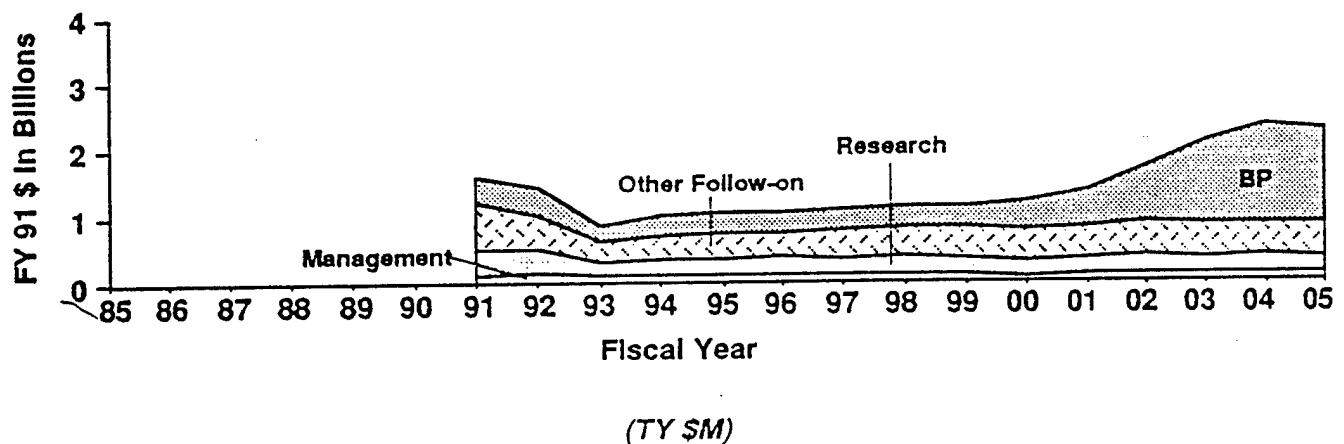
### Follow-On Concept Development

Funding for Follow-on activities and associated management will require roughly \$1 billion per year (in FY 1991 dollars). This funding profile is depicted in Figure 5 along with a "then-year" dollar break-out for the next seven years. Follow-

<sup>14</sup> Some LDS funds also indirectly support TMD missions. For example, collection assets necessary for the LDS test mission -- such as Cobra Judy, AST, and MSX -- will also gather important test data in support of the TMD program.

on Activities include those programs associated with the Space-Based Interceptor (or Brilliant Pebbles), Other Follow-On and Research and Support Program Elements. The first two programs support concept development activities that could, within 15 years, provide significant added performance capabilities for countering potential future threats that may well increase in both number and sophistication.<sup>15</sup> The Research and Support Program Element includes an innovative science and technology program that is highly regarded throughout the government and industry. It also supports, in an integrated way consistent with Congressional directions, LDS and TMD mission areas, including threat and countermeasures work and some costs for support staff.

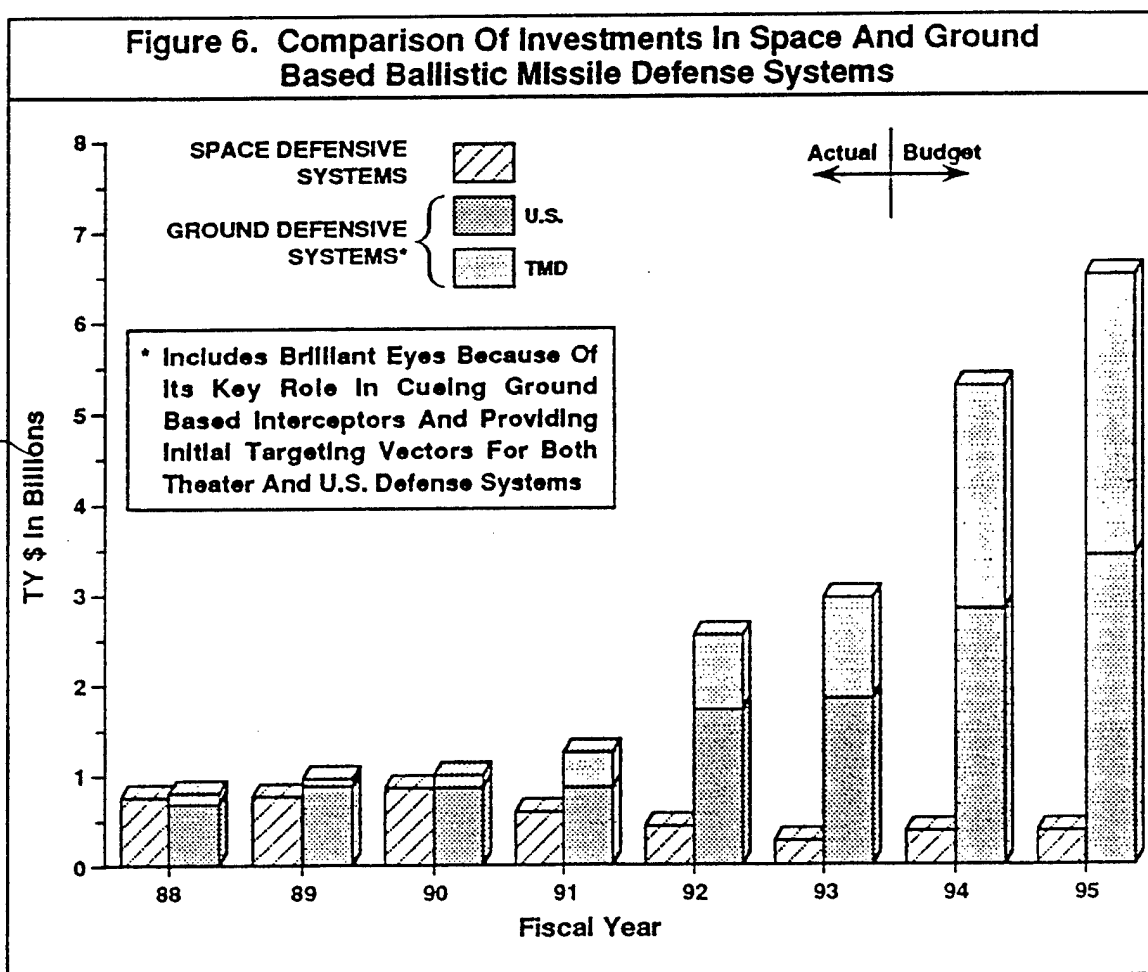
**Figure 5. Follow-on SDI (With Allocated Management)**



|                        | <u>FY 93</u> | <u>FY 94</u> | <u>FY 95</u> | <u>FY 96</u> | <u>FY 97</u> | <u>FY 98</u> | <u>FY 99</u> |
|------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>BP</b>              | 246          | 347          | 358          | 370          | 383          | 395          | 418          |
| <b>Other Follow-on</b> | 308          | 395          | 425          | 442          | 520          | 568          | 603          |
| <b>Research</b>        | 223          | 265          | 287          | 307          | 312          | 322          | 324          |
| <b>Management</b>      | 131          | 131          | 126          | 134          | 141          | 149          | 157          |
| <b>Total</b>           | <u>907</u>   | <u>1137</u>  | <u>1196</u>  | <u>1253</u>  | <u>1356</u>  | <u>1434</u>  | <u>1502</u>  |

<sup>15</sup> In both the Space-Based Interceptor and Other Follow-On R&D areas, the pace at which system concepts can be fully developed and fielded is set by the available funding -- not the state of technology. Present schedules could be considerably shortened, perhaps up to half, if technology limited development programs were funded.

While Brilliant Pebbles remains as a part of the Department's long-range acquisition plan, Congress unambiguously signaled it should not be part of the initial architecture they have approved. Accordingly, that program has been transformed into a follow-on concept demonstration program, still involving two contractor teams, that is "robustly funded" as explicitly specified in the Missile Defense Act.<sup>16</sup> The Brilliant Pebbles program is "flat-funded" at about \$350 million-per-year, the level authorized by the Senate Armed Services Committee last year. This means that for the rest of this decade less than 10 percent of the total dollars invested in development of ballistic missile defenses is for space based interceptor systems. Previously, such space-based defensive systems composed a much larger percentage of the SDI acquisition budget, e.g., almost half in FY 1990, as shown in Figure 6.



<sup>16</sup> The Joint Requirements Oversight Council (JROC) recently validated an overall Operational Requirements Document (ORD), which specified, among the requirements for an overall theater and U.S. homeland defense architecture and associated BMC3, those requirements that will guide the Brilliant Pebbles follow-on concept demonstration activities. Thus, while Brilliant Pebbles is not part of the initial architecture, the research activities are being pursued in a way that assures early user involvement in concept development consistent with sound acquisition management principles.

The Other Follow-On Program Element has been severely cut by Congress for the past two years -- the nation's directed energy programs are now funded at their lowest level in 20 years. In view of this Congressional reluctance to sustain major system acquisition efforts in this area, we have curtailed the Other Follow-On out-year funding request, deferring any planning wedges for moving into the formal acquisition process beyond concept demonstration activities. Budget and management authority for two follow-on programs, supporting boost-phase intercept concept development (initially with focus on an airborne laser option and the Free Electron Laser), worth over \$500 million over the FY 1994-1999 period, have been transferred to the Air Force and Army respectively -- consistent with directions in the FY 1993 National Defense Authorization Act. The residue of the dollars removed from the Other Follow-On Program Element in our previous budgets have been realigned within the TMDI program -- specifically in the Navy and Air Force program areas.

## CLOSURE

The above sections briefly review how SDIO has realigned the TMDI and USDI program to reflect Congressional directions, budget realities and Secretary Cheney's guidance that the Department implement as a top national priority the event-driven acquisition strategy in the July 2, 1992, Report to Congress. We have taken special care to preserve the basic event-driven acquisition strategy from this report, which was endorsed by Congress as being a low-to-moderate risk/concurrency plan consistent with the Missile Defense Act of 1991, as amended in 1992.

The TMDI plans are sound, with key development activities supported by the pertinent service, and in the main supported by a bipartisan solid majority in Congress. Although the Army is responsible for the largest share (about half) of our TMDI programs, our plans now involve a major initiative supporting Navy Theater Missile Defense activities to improve the existing AEGIS system to defend the fleet and wide-areas inland from ballistic missile attack. The program to support integrated Air Force TMD activities is evolving rapidly, and firm key elements are emerging -- including the areas of BMC3 and boost-phase defense, a shortfall in our program identified by SDIO, the Defense Science Board and the Air Force Scientific Advisory Board. The planned TMDI budget grows over the next two years from about \$1 billion in FY 1993 to about \$3 billion (in constant FY 1991 dollars) and remains relatively constant for the rest of the decade.

Although the associated bipartisan Congressional support is more fragile, plans for defending the United States are also sound and our budget is stabilizing -- requiring about \$3 billion per year (in constant FY 1991 dollars) for the next several

years to field an initial site in the FY 2000-2004 time frame, depending on whether and when a UOES option is exercised in the post FY 1997 time period. This plan preserves the event-driven acquisition strategy provided in our July 2 Report to Congress -- and subsequently accepted by the Defense Authorization Conferees as a low-to-moderate risk/concurrency plan as called for in the Missile Defense Act.

We also are planning for about \$1 billion per year to support research, development and evaluation of follow-on concepts -- including about \$350 million per year for Brilliant Pebbles. This third part of our program plan also supports the bulk of U.S. research on Directed Energy systems and a very successful innovative science and technology program.

With respect to other key management issues, it is important to note that the Deputy Secretary of Defense has approved a substantial increase in SDIO manpower to comply with the stated intent of the legislative record associated with the Pryor Amendment to the FY1993 Defense Authorization Act, which severely constrained SDIO support from SETA (Scientific, Engineering, and Technical Assistance) contracts. This is an important step to assuring the viability of the General Manager management structure for acquiring all DoD ballistic missile defenses, agreed between SDIO and the Military Departments, and approved by the Deputy Secretary of Defense in May 1992. This agreed management approach was an important step toward assuring that the Department's development of the fundamentally new ballistic missile defense system of systems is appropriately integrated across service lines and across both strategic and theater/regional mission areas.<sup>17</sup>

Finally, it is perhaps worth noting that, although our talks with Russia, the republics of the former Soviet Union, and our friends and allies show promise in moving toward the acceptance of a Global Protection System that will involve effective defenses, the legacy of our past interpretations of the ABM Treaty continues to constrain the development, testing, and/or possibly deployment of key elements of our architecture -- including theater missile defenses. This area deserves high priority attention, as specified by the Missile Defense Act and its associated legislative record, if costly constraints to key system elements are to be avoided. We should emphasize the development of unilateral U.S. steps where existing ambiguities permit and, otherwise, negotiate clarifications that:

-- assure our ability to fully test TMD systems against targets with the capability of existing, deployed theater ballistic missiles;

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<sup>17</sup> The three military departments have identified two-star flag officers to serve as Program Executive Officers and SDIO has reorganized to establish the General Manager's organization, now functioning with an Acting General Manager in place pending appropriate actions to complete nomination and confirmation of a three-star General Officer, as agreed in the May 1992 Memorandum of Agreement between the SDIO Director and the Service Secretaries.

-- assure that sensors can provide initial cuing to ground-based interceptors and provide initial targeting vectors;

-- free constraints on the full development and testing of all missile defenses, including those capable of boost phase intercept -- especially for TMD applications;

-- clarify and modify, as appropriate, perceived constraints on the international/joint or cooperative development, deployment, sale or export of TMD systems and related technologies; and

-- relax the constraints on deployment areas for ground-based U.S. defenses and numbers of interceptors.

If we hold firm to these objectives and continue negotiating in a multinational context toward a Global Protection System, as agreed by Presidents Boris Yeltsin and George Bush, there can be created a sound arms control and non-proliferation context that fosters effective defenses and deep reductions in offensive nuclear arms. In conjunction with the appropriate diplomatic efforts, the acquisition programs elaborated above can, if appropriately funded and executed, supplement, within this decade, the recently signed START agreement to achieve this end for the United States, our forces and citizens abroad, and our allies and friends around the world.

J. JAMES EKON, NEBRASKA  
 CARL LEVIN, MICHIGAN  
 EDWARD M. KENNEDY, MASSACHUSETTS  
 JEFF BINGAMAN, NEW MEXICO  
 ALAN J. BUXTON, ILLINOIS  
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 ROBERT C. BYRD, WEST VIRGINIA

ARNOLD L. FURMAN, STAFF DIRECTOR  
 PATRICK A. TUCKER, STAFF DIRECTOR FOR THE MINORITY

# United States Senate

COMMITTEE ON ARMED SERVICES  
 WASHINGTON, DC 20510-8050

October 29, 1992

Ambassador Henry F. Cooper  
 Director  
 Strategic Defense Initiative Organization  
 The Pentagon  
 Washington, D.C. 20301-7100

Dear Ambassador Cooper:

We are writing to express our deep concern that action is not being taken on specific congressional direction regarding the deployment of an initial, Treaty-compliant ABM site, as specified in the Missile Defense Act (MDA) of 1991, as amended this year.

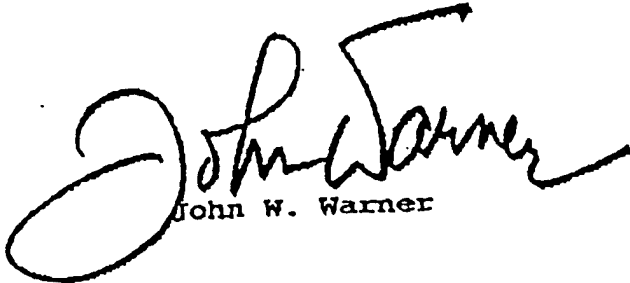
As you know, the MDA, as amended, directs the Secretary of Defense to deploy an ABM Treaty-compliant site consisting of: 100 ground-based interceptors; fixed ground-based ABM radars; and other Treaty-compliant sensors, including "optimum utilization of space-based sensors, including sensors capable of cueing ground-based antiballistic missile interceptors and providing initial targeting vectors ...." Congressional intent in drafting this language was to state, as a matter of law, that Brilliant Eyes serving as an adjunct to ground-based radar but not designed to perform direct battle management, is Treaty-compliant and should be considered for inclusion in the initial site architecture.

Since the amended MDA sets a deployment goal of 2002 for the initial site, SDIO now should be actively developing a Treaty-compliant version of Brilliant Eyes. This would not preclude Treaty amendments to allow Brilliant Eyes to be given on-board battle management capability in the future. In fact, the Conference Report on the FY 1993 Defense Authorization Act once again strongly urges the President to pursue such amendments.

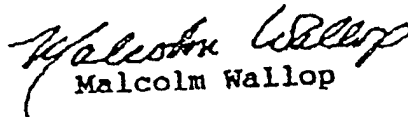
In the meantime, to ensure that we can meet the 2002 deadline, it is critical that the Administration declare Brilliant Eyes in an adjunct mode to be Treaty-compliant. Without such a declaration, we fear that Brilliant Eyes will be under-designed and endlessly delayed.

We need to move out now with a Brilliant Eyes program that can be part of the initial architecture by the year 2002. The MDA gives you the programmatic and legal guidance to do so. We hope you will follow it.

Sincerely,

  
John W. Warner

  
Strom Thurmond

  
Malcolm Wallop



DEPARTMENT OF DEFENSE  
STRATEGIC DEFENSE INITIATIVE ORGANIZATION  
WASHINGTON, DC 20301-7100

December 24, 1992

Honorable John Warner  
United States Senate  
Washington, DC 20510

Dear Senator Warner:

Thank you for your letter of October 29, 1992, which clarified that congressional intent in drafting the FY1993 Defense Authorization Act was "to state, as a matter of law, that Brilliant Eyes serving as an adjunct to ground-based radars but not designed to perform direct battle management is Treaty-compliant and should be considered for inclusion in the initial site architecture."

As recently noted in my response to an earlier letter from Senators Heflin and Shelby (enclosed), the Administration has not yet taken a final position on the compliance of deploying Brilliant Eyes (BE) or the Ground-launched Surveillance and Tracking System (GSTS) or on upgrading Early Warning Radars. I assure you, I am seeking to define a Treaty-compliant BE as a ground-based radar adjunct--in the same way that would be required for GSTS to be a Treaty-compliant adjunct, as Congress has argued. Clearly, the optimum initial site architecture would include BE to cue ground-based interceptors (GBI) and provide initial targeting vectors.

Given the FY1993 congressional budget cuts and delay, until 2002, of the target date for fielding the initial site, I recently terminated the GSTS in favor of BE, which we judged could have had an initial capability in 2001. The wisdom of that decision has been reinforced recently, with the award of the BE demonstration/validation contracts to TRW and Rockwell International. Based upon their plans and given our proposed budget, it now appears that a BE initial capability could be fielded as early as the year 2000--two years earlier than the congressional target date and at approximately the same time that our plans would permit us, if Congress approves no later than FY1997, to field the other elements of a User Operational Evaluation System (UOES) at the initial site.

This is earlier than we had thought prior to reviewing contractor proposals. Thus, no interim cueing capability may be necessary for even the contingency capability provided by prototypical GBIs, should Congress seek an early initial site capability. Nevertheless, we continue to preserve an option to upgrade the Early Warning Radars should there be unanticipated BE

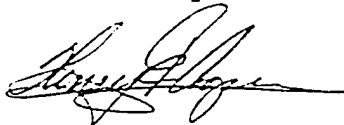
schedule slips--or if future GBI contractor inputs permit options to field the initial site even before the year 2000. I should note that there is essentially no cost impact of preserving the Early Warning Radar option prior to FY1996 or 1997.

I want to emphasize that BE will not only be an essential element of the initial U.S. site, permitting protection of the continental United States from ballistic missile attacks from the North. It will also increase the area that can be protected by future Theater Missile Defense (TMD) systems by an order of magnitude, and that will be important for the Theater High Altitude Area Defense (THAAD) system and for future Naval TMD systems. BE will also provide a very good surveillance capability on demand--in addition to accomplishing its primary mission in enhancing the capability of our future ballistic missile defense systems.

Because of these multiple capabilities, particularly those that could be important in future regional or theater conflicts, I would not strongly link the BE schedule to the initial site, but would press forward on BE as quickly as available funding will permit.

Finally, I want to assure you that I have resolutely sought to follow Secretary Cheney's direction in implementing the now congressionally-endorsed, event-driven acquisition strategy presented in our July 2, 1992, Report to Congress as "a top national priority, consistent with prudent management of cost, schedule, performance and technical risk factors." Thank you for your continued support, without which meeting our goals will be impossible.

Sincerely,



HENRY F. COOPER  
Director

Enclosure:  
As stated